Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-26. (Canceled)

27. (currently amended) A method of producing insulin in a subject in vivo, the method comprising introducing into the subject an intermediate lobe pituitary cell that ~~has been genetically engineered to express insulin~~ comprises a nucleic acid sequence encoding insulin, the nucleic acid sequence being operatively linked to a heterologous promoter that directs expression of the nucleic acid sequence in the intermediate lobe pituitary cell.

28-29. (Canceled)

30. (previously presented) The method of claim 27, wherein said intermediate lobe pituitary cell is an autologous cell.

31. (currently amended) The method of claim 27 ~~28~~, wherein said subject is a human and the intermediate lobe pituitary cell is an autologous cell.

Claims 32-59 (Canceled)

60. (previously presented) The method of claim 27, wherein said intermediate lobe pituitary cell is an allogenic cell.

61. (previously presented) The method of claim 27, wherein said intermediate lobe pituitary cell is a xenogenic cell.

62-63. (Canceled)

64. (currently amended) The method of claim 27 ~~28~~, wherein said cell further comprises one or more nucleotide sequence encoding a protein that controls expression of insulin in a glucose stimulated manner.

65. (previously presented) The method of claim 64, wherein said protein that controls expression of insulin in a glucose stimulated manner is a glucokinase.

66. (previously presented) The method of claim 65, wherein said glucokinase is the β-cell isoform of glucokinase.

67. (previously presented) The method of claim 64, wherein said protein that controls expression of insulin in a glucose stimulated manner is a glucose transporter.

68. (currently amended) The method of claim ~~66~~ 67, wherein said glucose transporter is GLUT-2.

69. (previously presented) The method of claim 64, wherein said protein that controls expression of insulin in a glucose stimulated manner is an ion channel that mediates glucose-stimulated insulin release.

70. (currently amended) The method of claim ~~68~~ 69, wherein said ion channel that mediates glucose-stimulated insulin release is a K+/ATP ion channel.

71. (previously presented) The method of claim 64, wherein said protein that controls expression of insulin in a glucose stimulated manner is glucagon-like peptide-1 (GLP-1).

72. (previously presented) The method of claim 64, further comprising evaluating the subject for a parameter relating to glucose metabolism or insulin secretion.

73. (currently amended) The method of claim ~~71~~ 72, wherein said parameter is selected from the group consisting of: the amount, distribution or structure of intracellular or extracellular insulin; glucose phosphorylating activity; glucose utilization; glucose uptake; and insulin secretion.

74. (currently amended) The method of claim 27 ~~28~~, wherein said ~~control region~~ promoter is a pro-opiomelanocortin (POMC) promoter.

75-78. (Canceled)

79. (previously presented) The method of claim 27, wherein said intermediate lobe pituitary cell is a fetal or post natal cell.

80. (previously presented) The method of claim 27, wherein said subject is a human.

81. (previously presented) The method of claim 27, wherein said intermediate lobe pituitary cell is a cultured cell.

82. (currently amended) The method of claim ~~80~~ 81, wherein said cultured cell is a cultured human cell.

83. (previously presented) The method of claim 27, wherein said cell is from a non-human transgenic animal.

84-85. (Canceled)

86. (previously presented) The method of claim 27, further comprising the step of administering an immunosuppressant to the subject.